State of Alaska
Department of Fish and Game
Nomination for Waters
Important to Anadromous Fish

AWC Volume SE (SC) SW W AR IN USGS Quad SELAOVIA D-3

Anadromous Water Catalog Number of Waterway 241-14-10625-2010

Name of Waterway BRADLEY RIVER USGS name X Local name _____

Addition X Deletion _____ Correction _____ Backup Information X

For Office Use

Nomination # 97 268			
Revision Year:		Regional Supervisor	Date 12/5/97
Revision to: Atlas X Catalog _____		EW Weiss	3/14/97
Both _____		AWC Project Biologist	Date
Revision Code: B-1 B-2		J. Stone	12/11/97
		Drafted	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Migration	Anadromous
COHO					
CHINOOK					
SOCKEYE					
PINK					
CHUM					

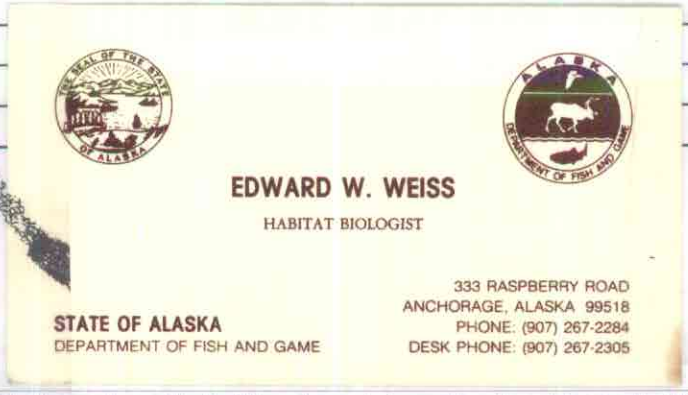
IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments: SEE ATTACHED EXCERPTS FROM REPORT Documentation used

Name of Observer (please print)

Date: _____ Signature:

Address:

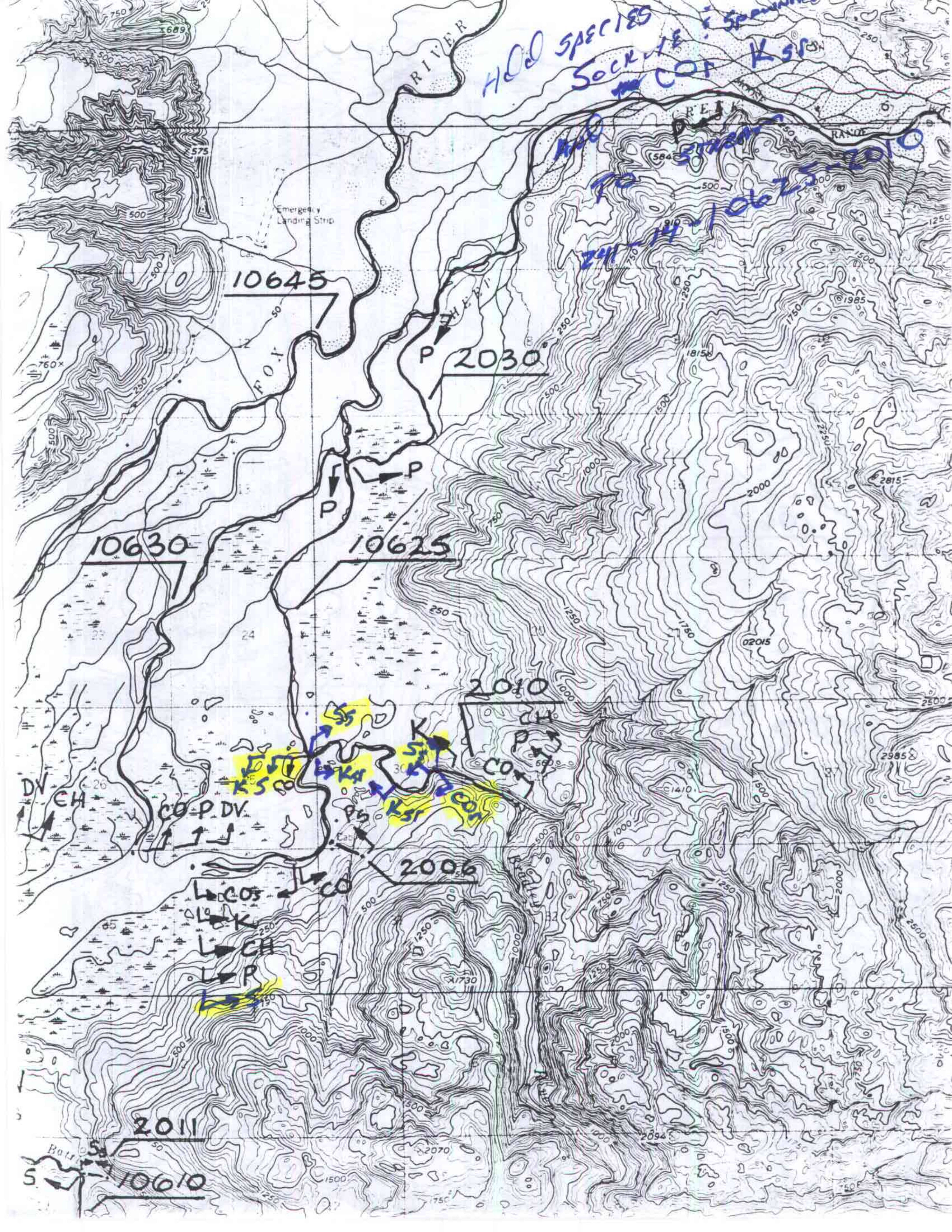


This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: EW Weiss 3/10/97

Nomform

Revision 7/93



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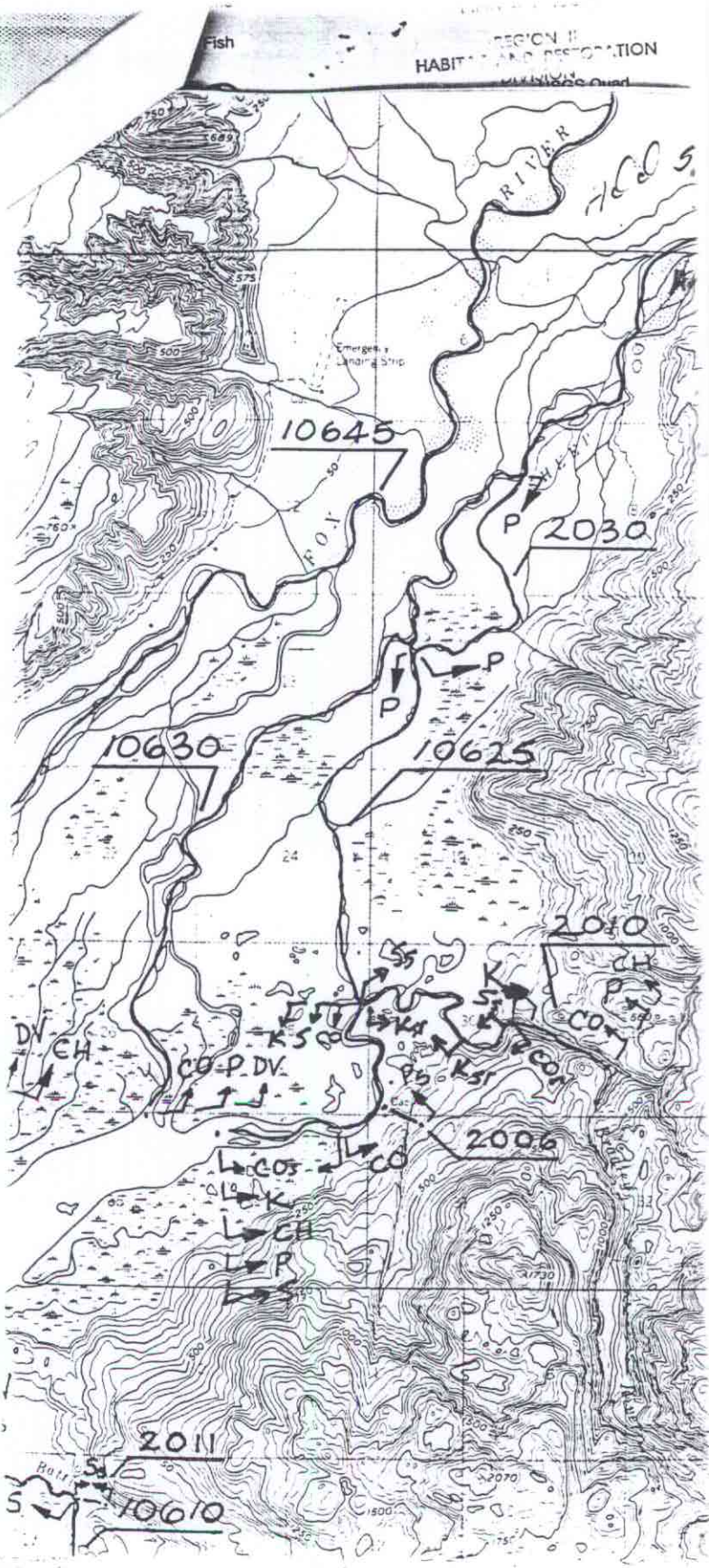
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ANNUAL REPORT

BRADLEY RIVER SALMON STUDY PROGRAM - 1996

By

John W. Morsell
Northern Ecological Services

Prepared for

Alaska Energy Authority

December 1996

condition codes were as follows:

Code	Condition
1	Fresh, non-spawning coloration, silvery
2	Spawning coloration, not ripe
3	Ripe, eggs or milt readily stripped
4	Spawned out
5	Visible deterioration
6	Dead

Beach Seine Sampling

As a supplemental sampling method, beach seining was conducted during Weeks 1 through 8. Seine sites are indicated on Figure 3. Sites S1 and S3 were seined consistently each week and site S7 was seined during Week 5. In most cases two hauls were made at each site. The seine utilized was 100 ft. long by 6 ft. deep, constructed of 2.5 in. stretch mesh netting. Captured fish were processed in a manner similar to that described for the trap net sampling.

Carcass Counts

All salmon carcasses observed within the study area were counted and tags were noted.

Fox Farm Creek Surveys

Visual surveys of fish present in Fox Farm Creek, a clear tributary to the Bradley River (Figure 1), were conducted once during each sample week. Observers walked the entire habitable length of the creek at lower tide levels and recorded the numbers of fish present for each species of salmon and the numbers of fish showing visible project tags.

capture.

In addition, population estimates were calculated based on selected seine catches.

Physical Data Collection

Air temperature, water temperature, turbidity, and stream stage were recorded daily at the field camp (Figure 1) on those days that the study crew was in the field. Turbidity was measured in the field using an HF Instruments Model DRT15 nephelometric turbidity meter. Stream stage was measured using a staff gage. The gage measurements were strictly relative and were not tied to any datum.

Miscellaneous Observations

Wildlife presence and other events of ecological interest were noted as they occurred.

RESULTS

Overall Catch

Overall catch for all methods combined (not including minnow traps) is summarized by week in Table 1. Complete catch records for all measured fish are presented in Appendix A.

As in past years, all five species of Pacific salmon indigenous to Alaska were captured in the Bradley River. Pink salmon again were the most abundant species with a total catch of 636 fish. Substantial numbers of chum (154 fish), coho (204 fish), sockeye (309 fish), and chinook (118 fish) salmon also were caught. In addition, 359 Dolly Varden (Salvelinus malma) were collected.

Trap Net Index Sampling

Trap nets were the primary sampling technique and proved to be effective at catching adult salmon. The sampling effort for the 6 index nets was uniform throughout the study period. Trap net fishing times for each net and week are summarized in Appendix B.

Pink Salmon

Pink salmon catch and catch-per-hour for each week and net are presented in Table 2. The catch-per-hour was low until the third week of August when numbers increased dramatically (Figure 4). Catch remained relatively high through the last week of the study. The maximum catch rate was reached in Week 6 at 0.389 fish per hour (Table 2).

Chum Salmon

Chum salmon catch was highest in mid-July during the first week of the study and declined precipitously after the end of July (Table 3 and Figure 5). The maximum catch rate occurred during the first week of the study at 0.281 fish per hour (Table 3).

Coho Salmon

Coho salmon (Table 4 and Figure 6) were first seen in the study area during Week 2 with catch rate increasing to a peak in mid-August and remaining high through the end of the study. The highest catch rate occurred during Week 5.

Sockeye Salmon

Sockeye salmon were present in the Bradley River during the entire study period (Table 5 and Figure 7) with the highest catch occurring during the mid- to late August period.

shows the percent frequency of occurrence of Condition 3 fish for both male and female pink salmon. During the first four weeks o the study, few pink salmon were present in the river, consequently the frequency data for this period is probably not a reliable indication of salmon maturity. Most pink salmon entered the river in mid-August and Figure 10 indicates that nearly all the males and about half of the females were ripe at the time of entry. The peak of spawning probably occurred in Week 6 very soon after the fish reached the spawning grounds. The pattern observed in prior years of gradual maturation of females while in freshwater was not observed in 1996.

Chum Salmon

During the first week of the study in mid-July, 97 percent of the males were ripe and 77 percent of the females. During Week 2, 90 percent of the males and 73 percent of the females were ripe. After Week 2 few chum salmon were left in the river. It is likely that chums were at the peak of spawning at the time that the study started.

Coho Salmon

Coho salmon were first observed in the Bradley River on July 30, however no ripe fish were seen until August 20. Percentage ripeness for Weeks 5 through 8 was 7, 0, 21, and 39 percent, respectively. No ripe females were observed during the study period. The peak of coho spawning likely occurred well after the end of the study period in late September or early October.

Sockeye Salmon

Small numbers of sockeyes were present in the Bradley River throughout the entire study period. Percentages of ripe fish in Weeks 1 through 8 were 0, 14, 33, 63, 79, 85, 70, and 50 percent respectively, suggesting that spawning occurred over a prolonged

the chinook salmon run; consequently, stream life duration cannot be accurately determined. Twenty-four chinook salmon were recaptured in 1996, most of which had been tagged in Week 1 and recaptured in Week 2. Two fish were recaptured in Week 3 that had been tagged 16 days earlier.

Spawning Area Location

The unusually high turbidity during the 1996 study period prevented most visual observations of spawning fish. General observations suggested that spawning locations were similar to prior years with two exceptions: (1) chinook salmon were visually observed for the first time spawning in the south channel of Riffle Reach downstream from Net 7 (Figure 3); and (2) seine sampling at Tree Bar Reach (Site S1) indicated that sockeye salmon were intermingled with pink salmon on the Tree Bar spawning area.

Fox Farm Creek Surveys

During visual surveys conducted each week at Fox Farm Creek, only one adult salmon was observed: a tagged sockeye salmon carcass was found in the creek on September 11. The fish had been tagged at Site S1 in the Bradley River on August 27.

Population Estimates

Pink Salmon

Weekly population estimates for pink salmon based on trap net recaptures using the same mark and recapture techniques employed in the 1986-1995 studies are presented in the first part of Table 11. Weekly population estimates ranged from a low of 85 in Week 2 to a high of 1000 in Week 5. Because of the small number of recaptures in all weeks, the 95 percent confidence limits (Table 11) for the estimates are broad and the statistical reliability of the estimates should be considered poor.

Chinook Salmon

Combining untagged captures with untagged carcasses results in a total of 117 individual chinook salmon that were handled during the study period. This represents the minimum number of fish present. The mark-recapture population estimate for Week 2 described above suggested that about 163 chinooks were present in the river at that time. A conservative estimate of the total escapement of chinooks in 1996 is 150-250 fish.

Tag Returns From Outside the Study Area

Two tagged fish were reported to the Alaska Department of Fish and Game in 1996. A coho salmon that was tagged in the Bradley River on August 13 was recovered by a sport fisherman at the Homer Spit lagoon on August 28. A second coho salmon that was tagged on August 22 was caught by a sport fisherman in the Homer Spit lagoon on September 2.

Minnow Trap Sampling

The ten minnow traps caught 105 juvenile chinook salmon, 74 coho salmon, 31 Dolly Varden, and 46 sculpins (Table 12). Most of the juvenile cohos were caught in two ponds within Bear Island Slough. These ponds were isolated from the main river at the time of sampling but become connected during high water periods. Chinook salmon were commonly found within the main channel of the Bradley River and in some backwater areas. Field differentiation between juvenile coho and chinook salmon in the Bradley River is difficult and some mistakes in identification were likely made. Length frequency analysis of the juvenile salmon (Figure 11) suggests that two age groups of chinooks and possibly two age groups of cohos were present. The length analysis indicates that some Bradley River chinooks spend two years in freshwater prior to outmigration.

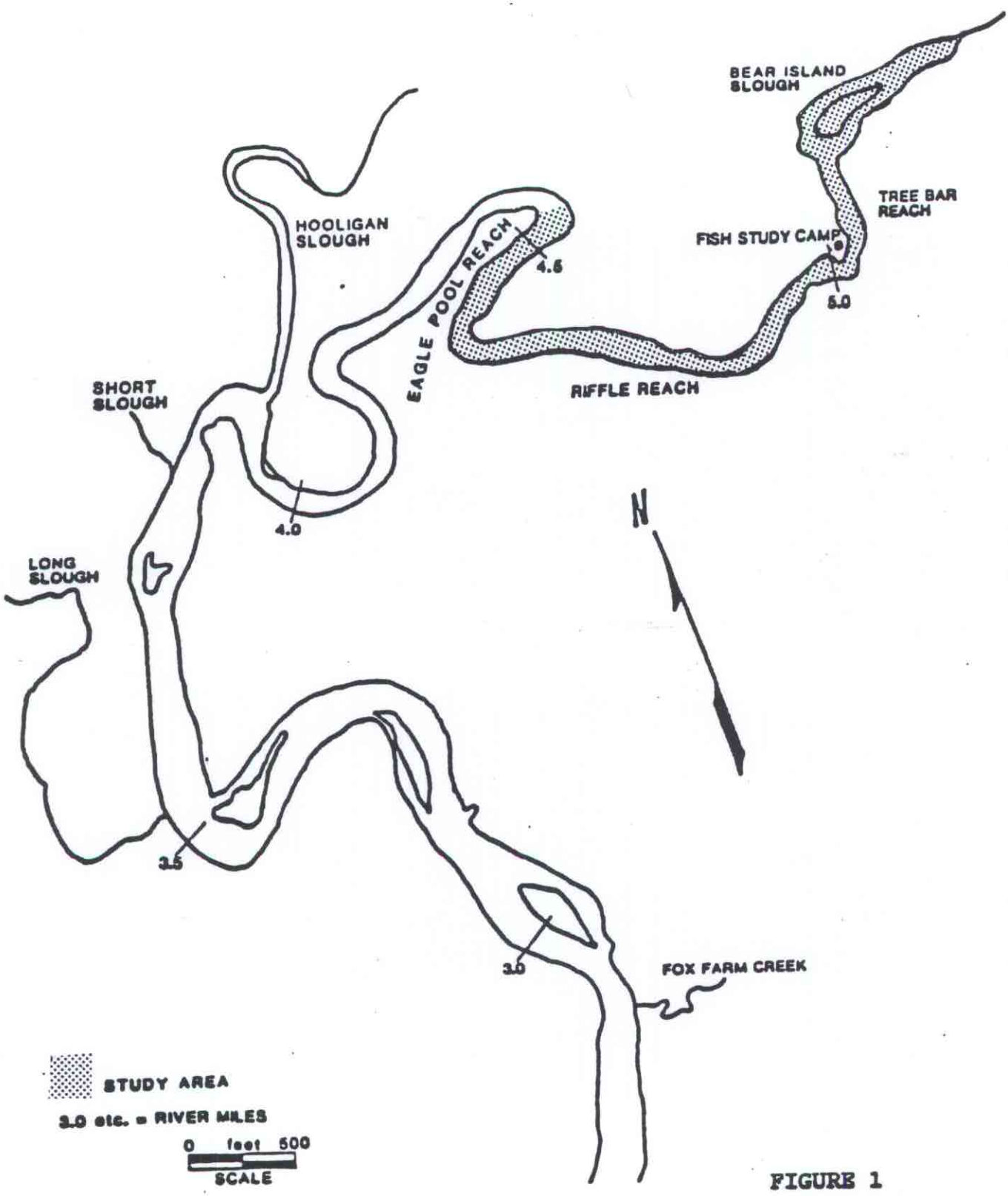

FIGURE 1

LOWER BRADLEY RIVER WITH SALMON ESCAPEMENT STUDY AREA

TABLE 1. TOTAL CATCH FOR ALL SAMPLE METHODS COMBINED - 1996

WEEK NO.	DATES	PINK SALMON	CHUM SALMON	COHO SALMON	SOCKEYE SALMON	CHINOOK SALMON	DOLLY VARDEN
1	JUL 23-25	24	80	0	5	56	49
2	JUL 30-AUG 1	17	62	1	7	39	82
3	AUG 6-8	13	6	7	15	12	16
4	AUG 13-15	27	0	21	62	7	40
5	AUG 20-22	124	4	57	79	4	54
6	AUG 27-29	167	0	35	90	0	71
7	SEP 3-5	106	1	44	32	0	11
8	SEP 10-12	158	1	39	19	0	36
	TOTAL	636	154	204	309	118	359

TABLE 3. TRAP NET CATCH STATISTICS FOR CHUM SALMON-1996

	SAMPLING WEEK																	
	1		2		3		4		5		6		7		8		TOTAL	
NET	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH
1	3	0.064	19	0.392	2	0.042	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	24	0.063
3	9	0.191	13	0.267	0	0.000	0	0.000	0	0.000	0	0.000	1	0.021	1	0.021	24	0.063
4	5	0.107	6	0.123	1	0.021	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	12	0.031
5A	12	0.255	4	0.082	1	0.021	0	0.000	2	0.043	0	0.000	0	0.000	0	0.000	19	0.050
6A	38	0.810	13	0.269	1	0.021	0	0.000	1	0.021	0	0.000	0	0.000	0	0.000	53	0.139
7A	12	0.256	4	0.082	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	16	0.042
TOTAL	79	0.281	59	0.202	5	0.018	0	0.000	3	0.011	0	0.000	1	0.004	1	0.003	148	0.065

TABLE 5. TRAP NET CATCH STATISTICS FOR SOCKEYE SALMON-1996

	SAMPLING WEEK																	
	1		2		3		4		5		6		7		8		TOTAL	
NET	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH
1	0	0.000	1	0.021	0	0.000	1	0.021	1	0.021	8	0.166	1	0.021	2	0.041	14	0.037
3	0	0.000	0	0.000	0	0.000	2	0.041	5	0.107	5	0.104	3	0.064	1	0.021	16	0.042
4	0	0.000	2	0.041	6	0.128	19	0.395	9	0.190	5	0.103	3	0.064	3	0.062	47	0.123
5A	2	0.043	0	0.000	1	0.021	3	0.062	19	0.405	15	0.310	7	0.150	2	0.041	49	0.129
6A	0	0.000	1	0.021	1	0.021	11	0.228	18	0.385	24	0.497	8	0.171	5	0.104	68	0.179
7A	3	0.064	2	0.041	7	0.147	25	0.512	11	0.234	5	0.103	3	0.064	6	0.124	62	0.162
TOTAL	5	0.018	6	0.021	15	0.053	61	0.210	63	0.223	62	0.213	25	0.089	19	0.066	256	0.112

TABLE 7. TRAP NET CATCH STATISTICS FOR DOLLY VARDEN-1996

	SAMPLING WEEK																	
	1		2		3		4		5		6		7		8		TOTAL	
NET	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH	CATCH	CPH
1	12	0.256	18	0.371	5	0.106	7	0.145	9	0.192	25	0.518	3	0.064	8	0.166	87	0.228
3	10	0.213	7	0.144	1	0.021	9	0.186	2	0.043	5	0.104	1	0.021	4	0.083	39	0.102
4	2	0.043	13	0.267	2	0.043	3	0.062	7	0.148	6	0.123	0	0.000	1	0.021	34	0.089
5A	4	0.085	6	0.123	2	0.043	4	0.083	5	0.107	8	0.165	2	0.043	1	0.021	32	0.084
6A	12	0.256	19	0.393	9	0.191	9	0.187	20	0.427	19	0.393	4	0.085	15	0.313	107	0.281
7A	2	0.043	11	0.225	2	0.042	5	0.102	4	0.085	5	0.103	0	0.000	5	0.103	34	0.089
TOTAL	42	0.149	74	0.254	21	0.074	37	0.128	47	0.167	68	0.234	10	0.036	34	0.117	333	0.146

TABLE 12. RESULTS OF MINNOW TRAP SURVEY IN BRADLEY RIVER - SEPTEMBER 10-11, 1996.

TRAP NO.	HABITAT TYPE	SET TIME (HRS.)	CHINOOK SALMON	COHO SALMON	DOLLY VARDEN	SCULPIN
1	Main Stem Margin	18.9	5			2
2	Main Stem Margin	19	4			
3	Main Stem Margin	19	12		1	2
4	Slough Pond	21.1		22	1	1
5	Slough Pond	20.7	3	35	2	2
6	Backwater	18.5	12		4	30
7	Main Stem Margin	18.9	36	1	5	4
8	Backwater	20.1	24	16	7	4
9	Main Stem Margin	19.4	3			1
10	Main Stem Margin	19.6	6		11	

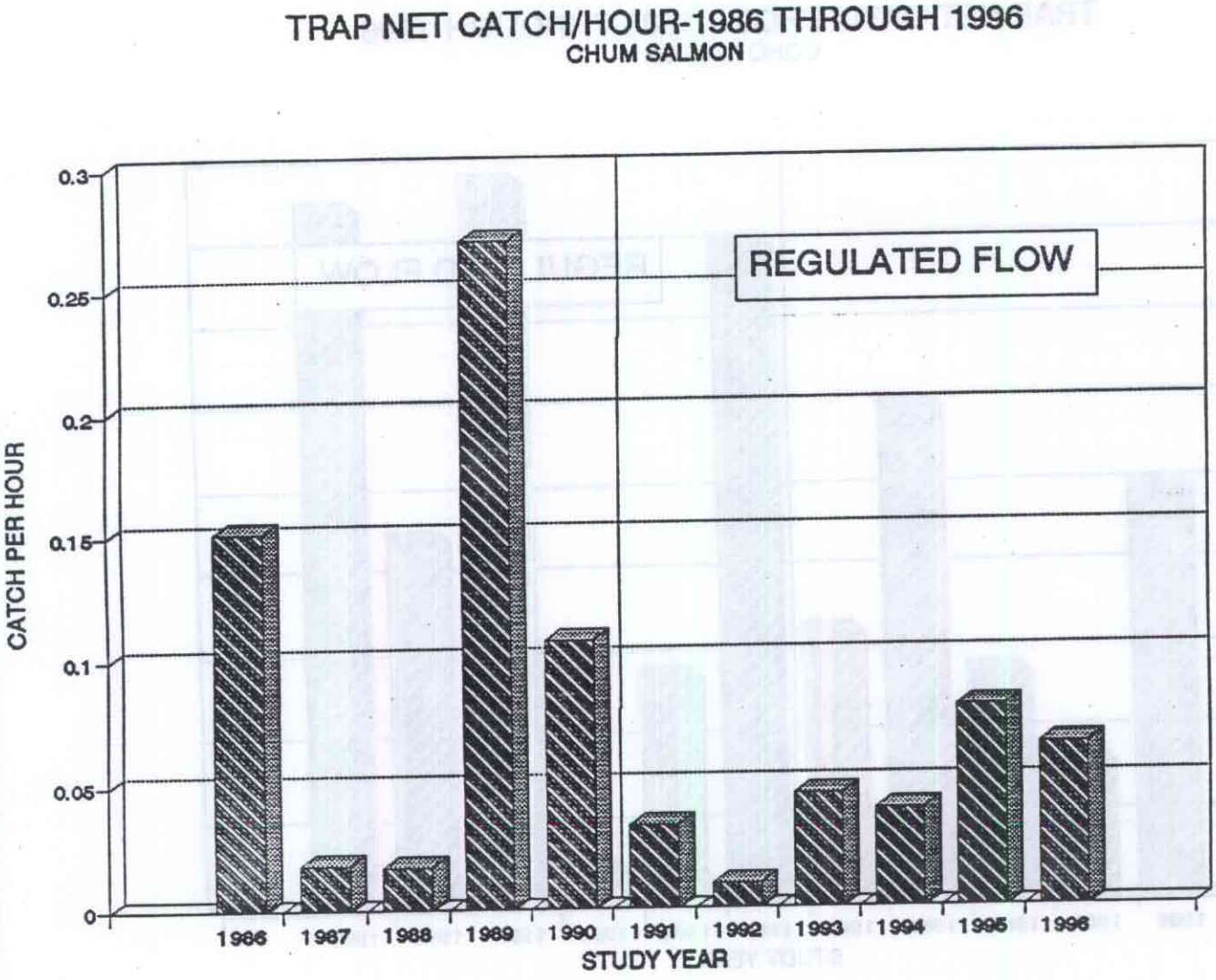

Figure 13. Trap net catch-per-hour for chum salmon - 1986 through 1996.

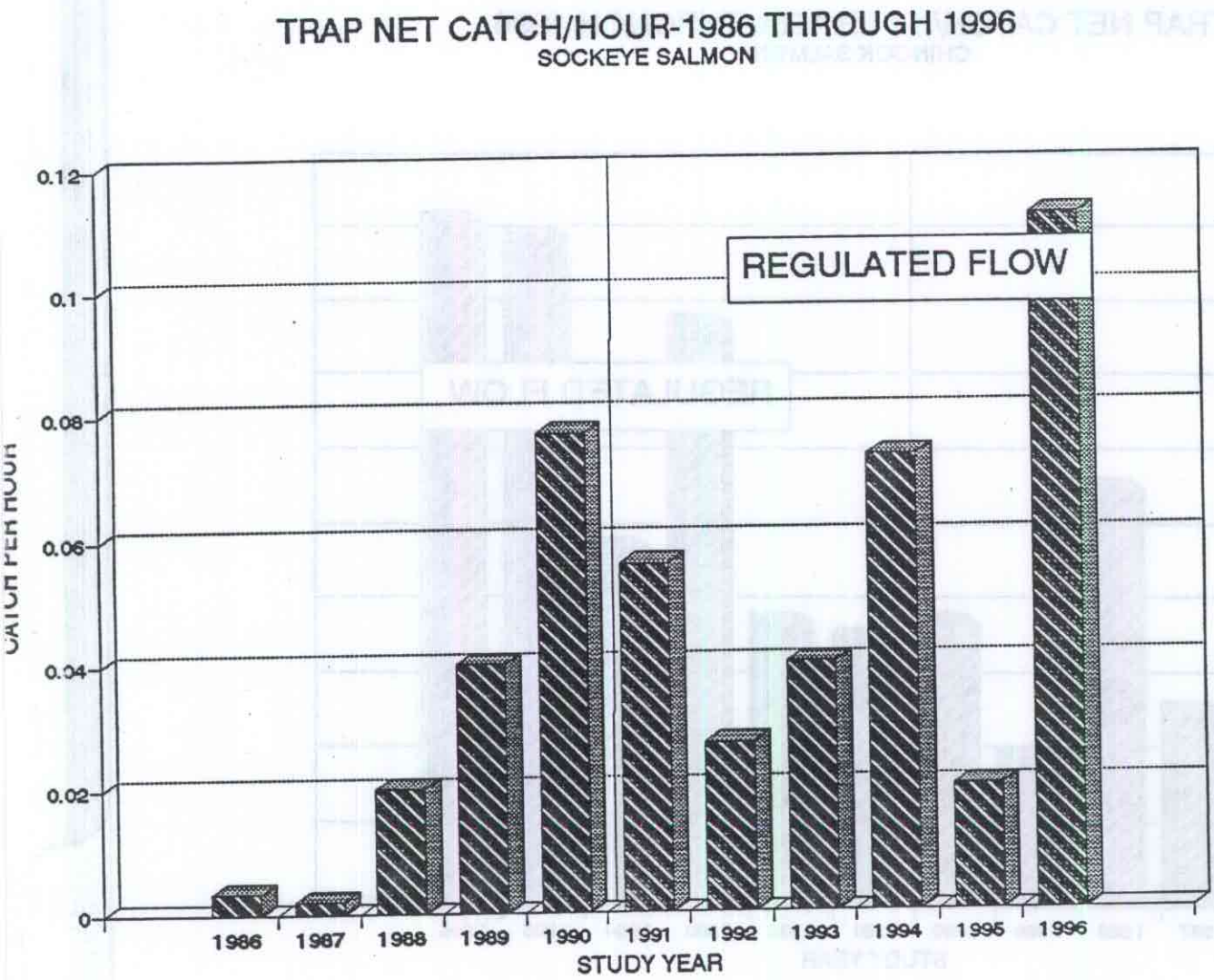

Figure 15. Trap net catch-per-hour for sockeye salmon - 1986 through 1996.